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(54) **SURGICAL ACCESS DEVICE INCLUDING ANCHOR WITH RACHET MECHANISM**

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CPC A61B 17/3421; A61B 17/3423; A61B 2017/347; A61B 2017/3488; A61B 2017/3482; A61B 2017/3492
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

397,060 A 1/1889 Knapp
512,456 A 1/1894 Sadikova
1,213,005 A 1/1917 Pillsbury
2,912,981 A 11/1959 Keough
2,936,760 A 5/1960 Gains
3,039,468 A 6/1962 Price
3,050,066 A 8/1962 Koehn
3,253,594 A 5/1966 Matthews et al.
3,397,699 A 8/1968 Kohl
3,545,443 A 12/1970 Ansari et al.
3,713,447 A 1/1973 Adair
(Continued)

FOREIGN PATENT DOCUMENTS

DE 102005047527 A1 4/2007
EP 0480653 A1 4/1992
(Continued)

OTHER PUBLICATIONS

Extended European Search Report dated Jun. 14, 2021 issued in EP Appln. No. 21155396.1.
(Continued)

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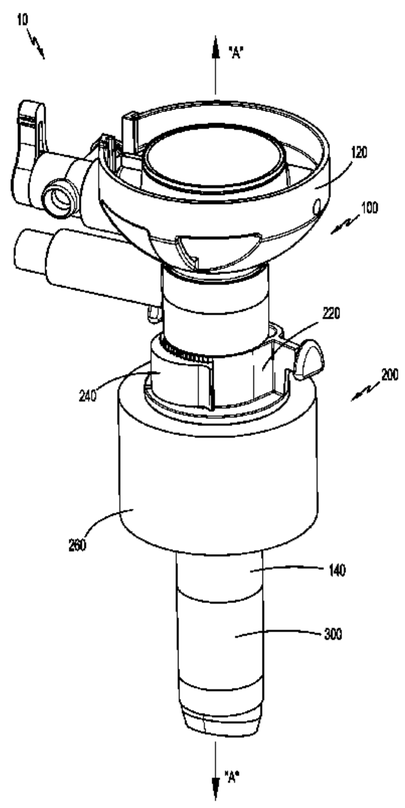
(57) **ABSTRACT**

A surgical access device includes a cannula body and an anchor. The cannula body includes a housing, and an elongated portion extending distally from the housing. The elongated portion defines a longitudinal axis and defines a channel extending therethrough. The anchor is disposed in mechanical cooperation with the elongated portion of the cannula body and is longitudinally translatable relative to the elongated portion. The anchor defines an aperture and includes a ratchet mechanism configured to selectively lock a size of the aperture.

20 Claims, 7 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

3,774,596	A	11/1973	Cook
3,800,788	A	4/1974	White
3,882,852	A	5/1975	Sinnreich
3,896,816	A	7/1975	Mattler
3,961,632	A	6/1976	Moossun
RE29,207	E	5/1977	Bolduc et al.
4,083,369	A	4/1978	Sinnreich
4,217,889	A	8/1980	Radovan et al.
4,243,050	A	1/1981	Littleford
4,276,874	A	7/1981	Wolvek et al.
4,312,353	A	1/1982	Shahbabian
4,327,709	A	5/1982	Hanson et al.
4,345,606	A	8/1982	Littleford
4,411,654	A	10/1983	Boarini et al.
4,416,267	A	11/1983	Garren et al.
4,490,137	A	12/1984	Moukheibir
4,496,345	A	1/1985	Hasson
4,574,806	A	3/1986	McCarthy
4,581,025	A	4/1986	Timmermans
4,596,554	A	6/1986	Dastgeer
4,596,559	A	6/1986	Fleischhacker
4,608,965	A	9/1986	Anspach, Jr. et al.
4,644,936	A	2/1987	Schiff
4,654,030	A	3/1987	Moll et al.
4,685,447	A	8/1987	Iversen et al.
4,701,163	A	10/1987	Parks
4,738,666	A	4/1988	Fuqua
4,769,038	A	9/1988	Bendavid et al.
4,772,266	A	9/1988	Groshong
4,779,611	A	10/1988	Grooters et al.
4,784,133	A	11/1988	Mackin
4,793,348	A	12/1988	Palmaz
4,798,205	A	1/1989	Bonomo et al.
4,800,901	A	1/1989	Rosenberg
4,802,479	A	2/1989	Haber et al.
4,813,429	A	3/1989	Eshel et al.
4,840,613	A	6/1989	Balbierz
4,854,316	A	8/1989	Davis
4,861,334	A	8/1989	Nawaz
4,865,593	A	9/1989	Ogawa et al.
4,869,717	A	9/1989	Mair
4,888,000	A	12/1989	McQuilkin et al.
4,899,747	A	2/1990	Garren et al.
4,917,668	A	4/1990	Haindl
4,931,042	A	6/1990	Holmes et al.
4,955,895	A	9/1990	Sugiyama et al.
5,002,557	A	3/1991	Hasson
5,009,643	A	4/1991	Reich et al.
5,030,206	A	7/1991	Lander
5,030,227	A	7/1991	Rosenbluth et al.
5,074,871	A	12/1991	Groshong
5,098,392	A	3/1992	Fleischhacker et al.
5,104,383	A	4/1992	Shichman
5,116,318	A	5/1992	Hillstead
5,116,357	A	5/1992	Eberbach
5,122,122	A	6/1992	Allgood
5,122,155	A	6/1992	Eberbach
5,137,512	A	8/1992	Burns et al.
5,141,494	A	8/1992	Danforth et al.
5,141,515	A	8/1992	Eberbach
5,147,302	A	9/1992	Euteneuer et al.
5,147,316	A	9/1992	Castillenti
5,147,374	A	9/1992	Fernandez
5,158,545	A	10/1992	Trudell et al.
5,159,925	A	11/1992	Neuwirth et al.
5,163,949	A	11/1992	Bonutti
5,176,692	A	1/1993	Wilk et al.
5,176,697	A	1/1993	Hasson et al.
5,183,463	A	2/1993	Debbas
5,188,596	A	2/1993	Condon et al.
5,188,630	A	2/1993	Christoudias
5,195,507	A	3/1993	Bilweis
5,201,742	A	4/1993	Hasson
5,201,754	A	4/1993	Crittenden et al.
5,209,725	A	5/1993	Roth
5,215,526	A	6/1993	Deniega et al.
5,215,531	A	6/1993	Maxson et al.
5,222,970	A	6/1993	Reeves
5,226,890	A	7/1993	Ianniruberto et al.
5,232,446	A	8/1993	Arney
5,232,451	A	8/1993	Freitas et al.
5,234,454	A	8/1993	Bangs
5,250,025	A	10/1993	Sosnowski et al.
5,258,026	A	11/1993	Johnson et al.
5,269,753	A	12/1993	Wilk
5,290,249	A	3/1994	Foster et al.
5,308,327	A	5/1994	Heaven et al.
5,309,896	A	5/1994	Moll et al.
5,314,443	A	5/1994	Rudnick
5,318,012	A	6/1994	Wilk
5,330,497	A	7/1994	Freitas et al.
5,342,307	A	8/1994	Euteneuer et al.
5,346,504	A	9/1994	Ortiz et al.
5,359,995	A	11/1994	Sewell, Jr.
5,361,752	A	11/1994	Moll et al.
5,370,134	A	12/1994	Chin et al.
5,383,889	A	1/1995	Warner et al.
5,397,311	A	3/1995	Walker et al.
5,402,772	A	4/1995	Moll et al.
5,407,433	A	4/1995	Loomas
5,431,173	A	7/1995	Chin et al.
5,445,615	A	8/1995	Yoon
5,468,248	A	11/1995	Chin et al.
5,514,091	A	5/1996	Yoon
5,514,153	A	5/1996	Bonutti
5,540,658	A	7/1996	Evans et al.
5,540,711	A	7/1996	Kieturakis et al.
5,607,441	A	3/1997	Sierocuk et al.
5,607,443	A	3/1997	Kieturakis et al.
5,632,761	A	5/1997	Smith et al.
5,656,013	A	8/1997	Yoon
5,667,479	A	9/1997	Kieturakis
5,667,520	A	9/1997	Bonutti
5,704,372	A	1/1998	Moll et al.
5,707,382	A	1/1998	Sierocuk et al.
5,713,869	A	2/1998	Morejon
5,716,369	A	2/1998	Riza
5,722,986	A	3/1998	Smith et al.
5,728,119	A	3/1998	Smith et al.
5,730,748	A	3/1998	Fogarty et al.
5,730,756	A	3/1998	Kieturakis et al.
5,738,628	A	4/1998	Sierocuk et al.
5,755,693	A	5/1998	Walker et al.
5,762,604	A	6/1998	Kieturakis
5,772,680	A	6/1998	Kieturakis et al.
5,779,728	A	7/1998	Lunsford et al.
5,797,947	A	8/1998	Mollenauer
5,803,901	A	9/1998	Chin et al.
5,810,867	A	9/1998	Zarbatany et al.
5,814,060	A	9/1998	Fogarty et al.
5,836,913	A	11/1998	Orth et al.
5,836,961	A	11/1998	Kieturakis et al.
5,865,802	A	2/1999	Yoon et al.
5,893,866	A	4/1999	Hermann et al.
5,925,058	A	7/1999	Smith et al.
6,361,543	B1	3/2002	Chin et al.
6,368,337	B1	4/2002	Kieturakis et al.
6,375,665	B1	4/2002	Nash et al.
6,379,372	B1	4/2002	Dehdashtian et al.
6,432,121	B1	8/2002	Jervis
6,447,529	B2	9/2002	Fogarty et al.
6,468,205	B1	10/2002	Mollenauer et al.
6,506,200	B1	1/2003	Chin
6,514,272	B1	2/2003	Kieturakis et al.
6,517,514	B1	2/2003	Campbell
6,527,787	B1	3/2003	Fogarty et al.
6,540,764	B1	4/2003	Kieturakis et al.
6,796,960	B2	9/2004	Cioanta et al.
8,454,645	B2	6/2013	Criscuolo et al.
2005/0043685	A1	2/2005	Schinkel-Fleitmann
2009/0182282	A1	7/2009	Okihisa et al.
2010/0057010	A1	3/2010	Goransson

(56) **References Cited**

U.S. PATENT DOCUMENTS

2011/0218620	A1*	9/2011	Meiri	A61B 17/12013 623/2.11
2017/0056064	A1*	3/2017	Zergiebel	A61B 17/3474
2019/0254703	A1	8/2019	Ciampini et al.	

FOREIGN PATENT DOCUMENTS

EP	0610099	A2	8/1994
EP	0880939	A1	12/1998
WO	9206638	A1	4/1992
WO	9218056	A1	10/1992
WO	9221293	A1	12/1992
WO	9221295	A1	12/1992
WO	9309722	A1	5/1993
WO	9721461	A1	6/1997
WO	9912602	A1	3/1999
WO	0126724	A2	4/2001
WO	02096307	A2	12/2002
WO	2004032756	A2	4/2004
WO	2015049391	A1	4/2015
WO	2018094478	A1	5/2018

OTHER PUBLICATIONS

European Search Report dated Apr. 7, 2022 issued in related EP Appln. No. 21215640.0.

* cited by examiner

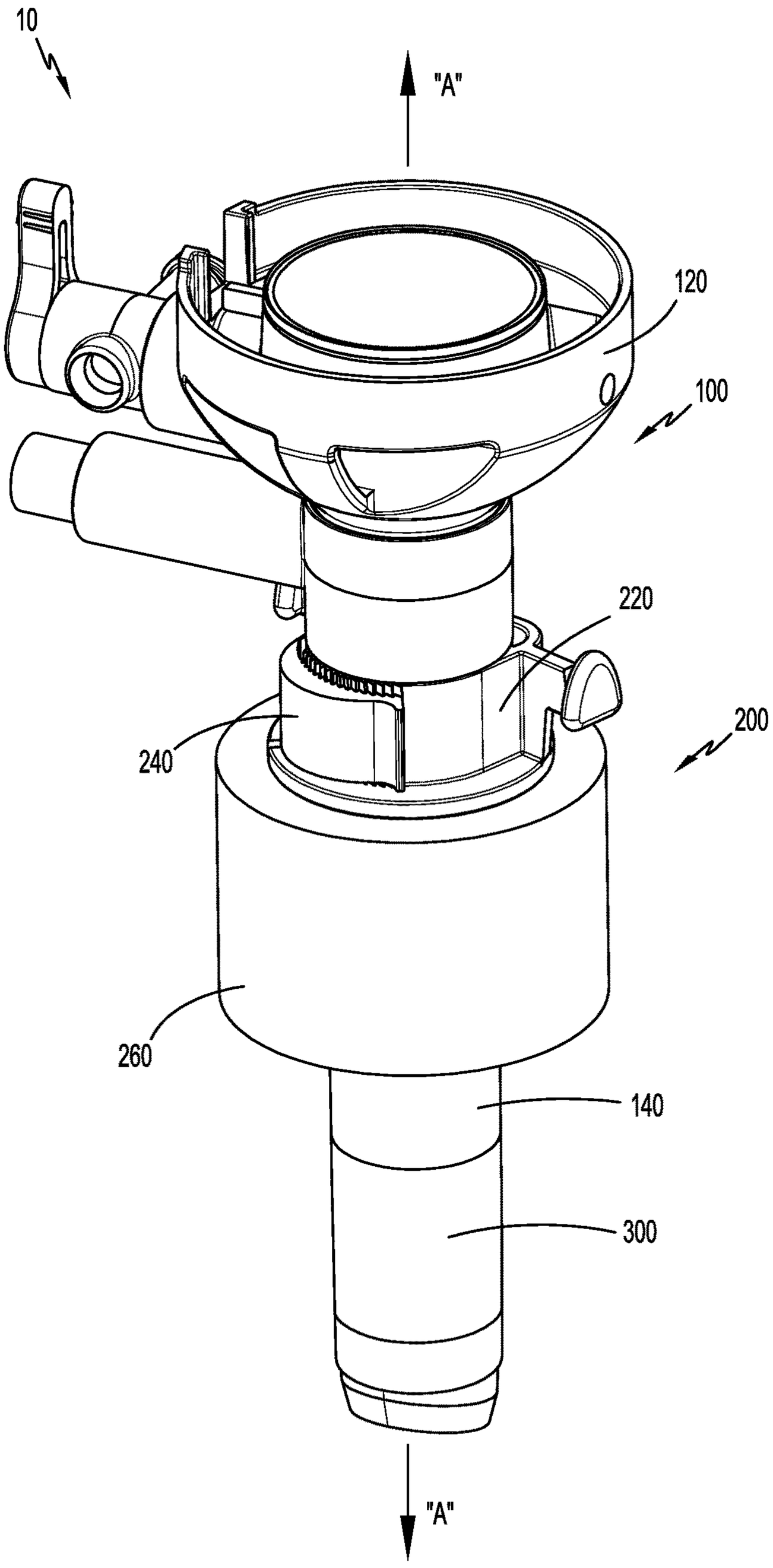


FIG. 1

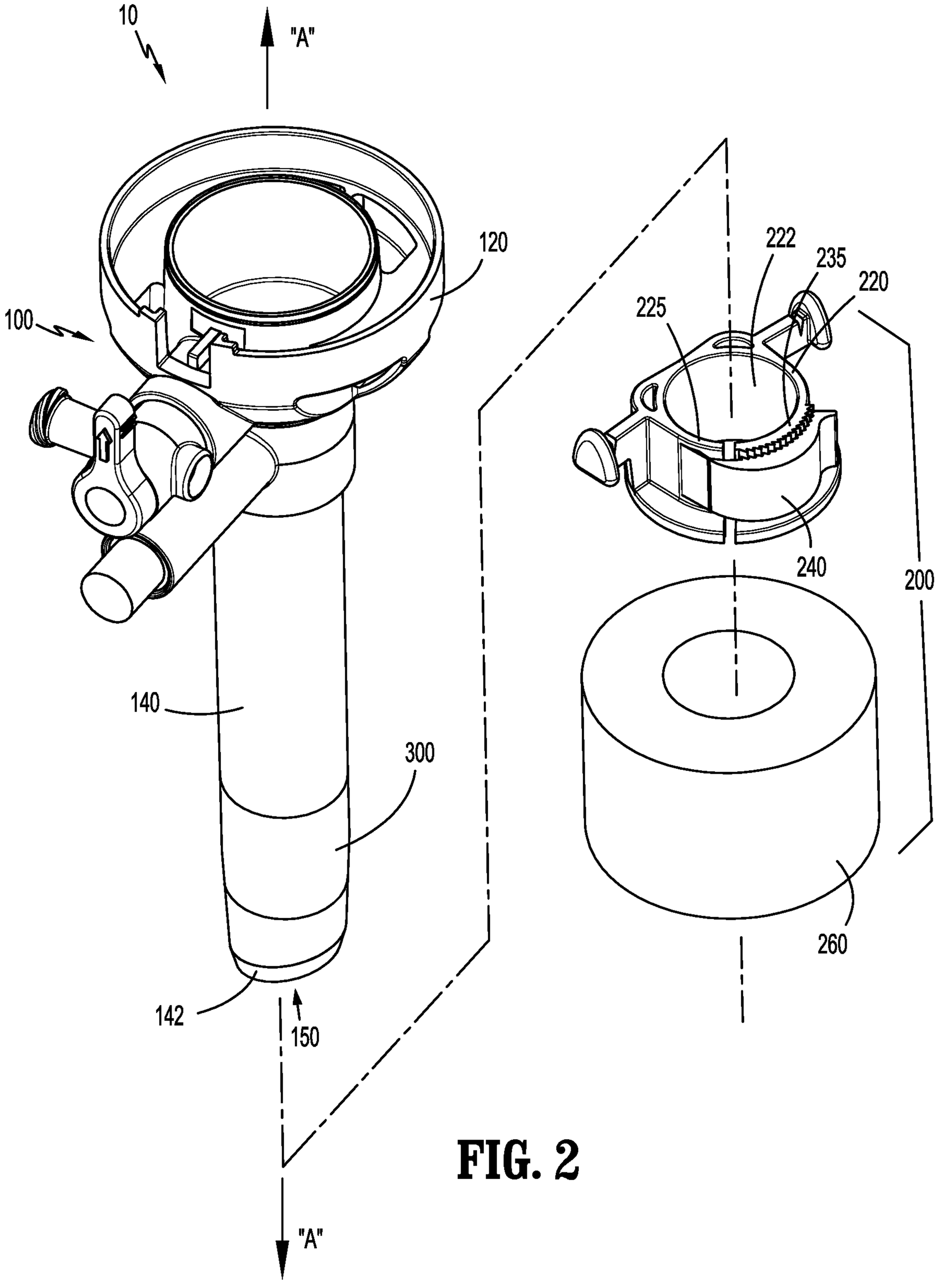


FIG. 2

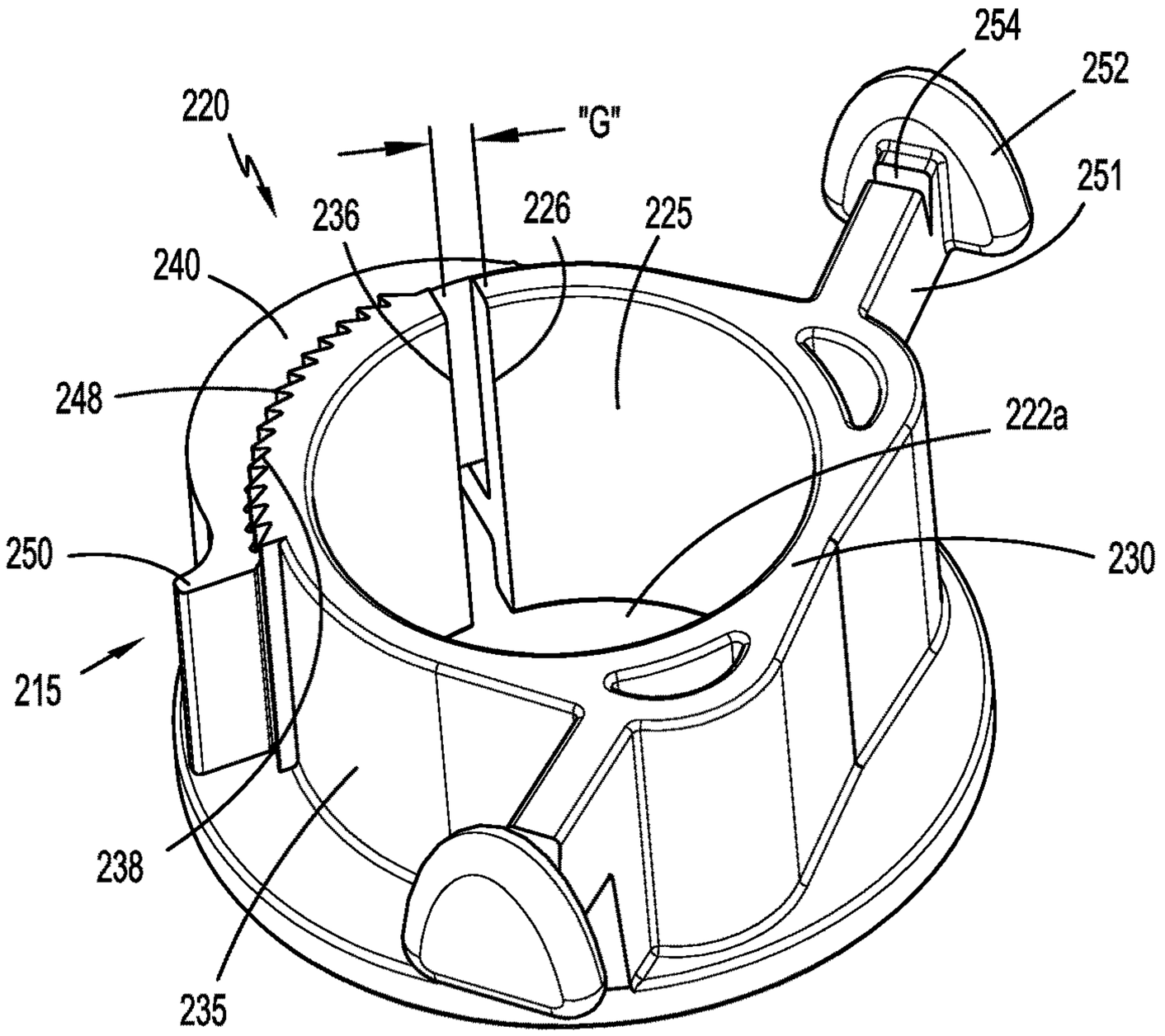

254
252
220
"G"
251
236
226
225
240
248
222a
250
230
215
238
235

FIG. 3

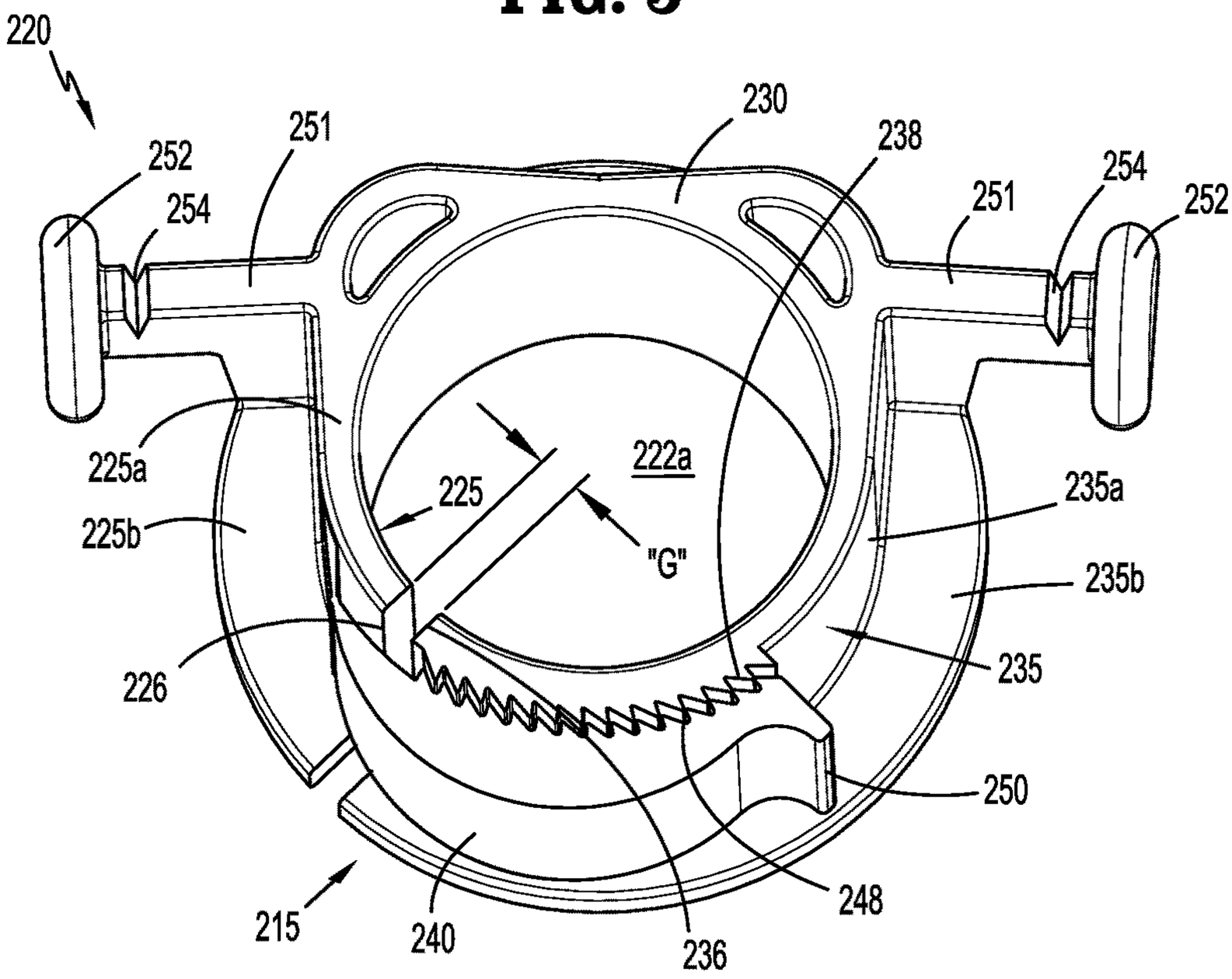

220
230
252
251
238
254
251
254
252
225a
222a
225
235a
225b
"G"
235b
226
235
250
248
215
240
236

FIG. 4

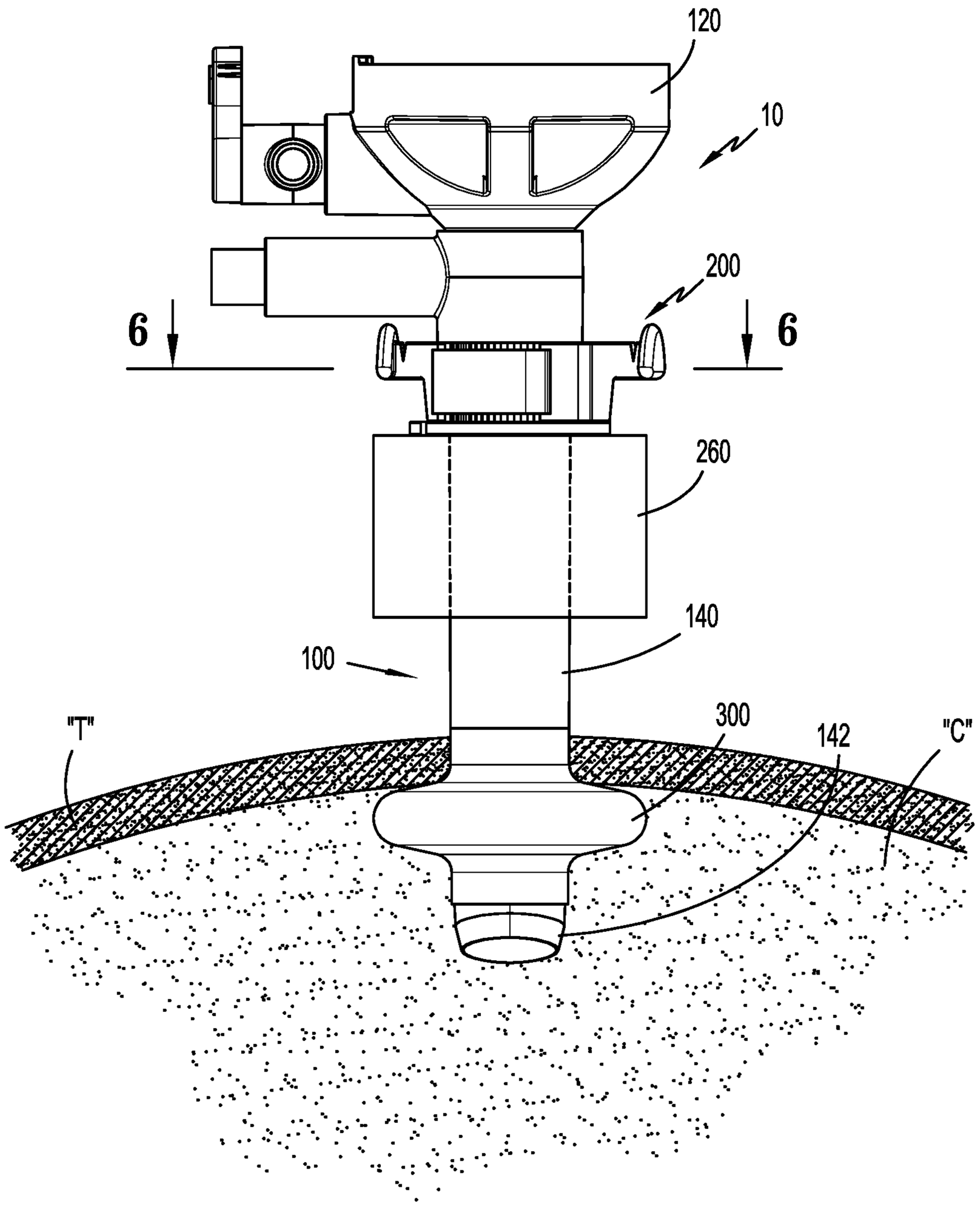


FIG. 5

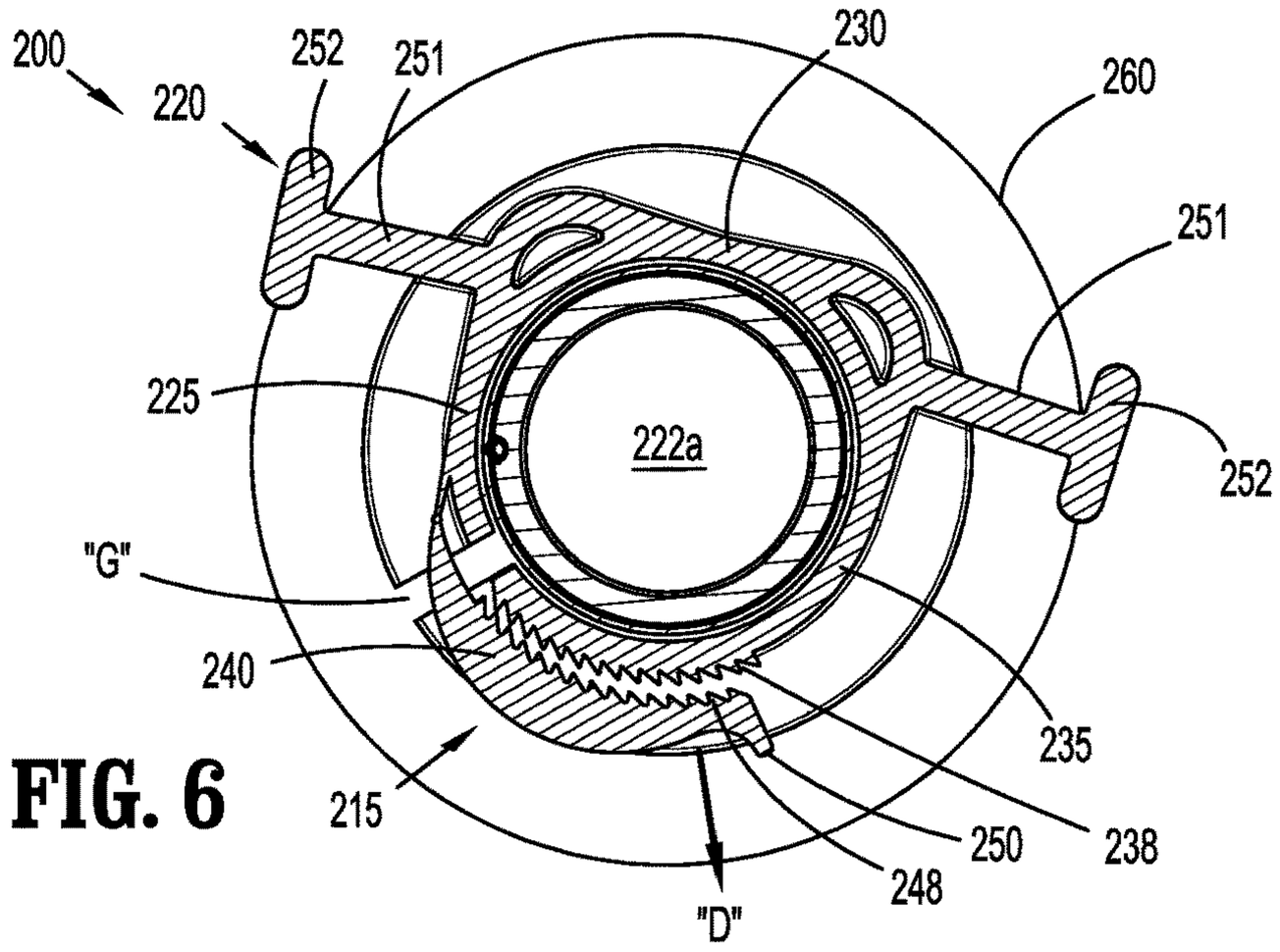

200
220
252
251
230
260
251
225
222a
252
"G"
240
235
215
250
238
248
"D"

FIG. 6

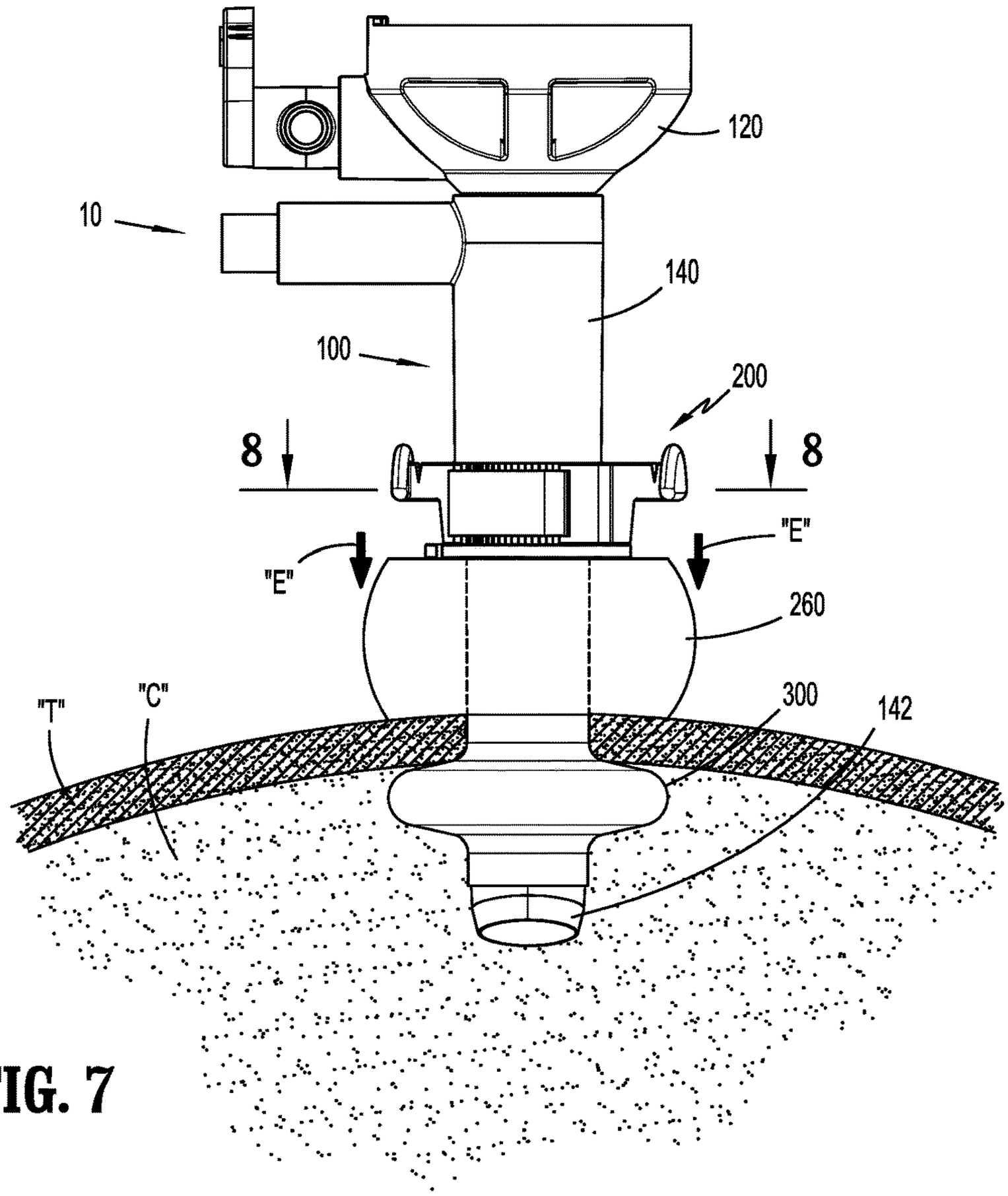

120
10
140
100
200
8
8
"E"
"E"
260
"T"
"C"
300
142

FIG. 7

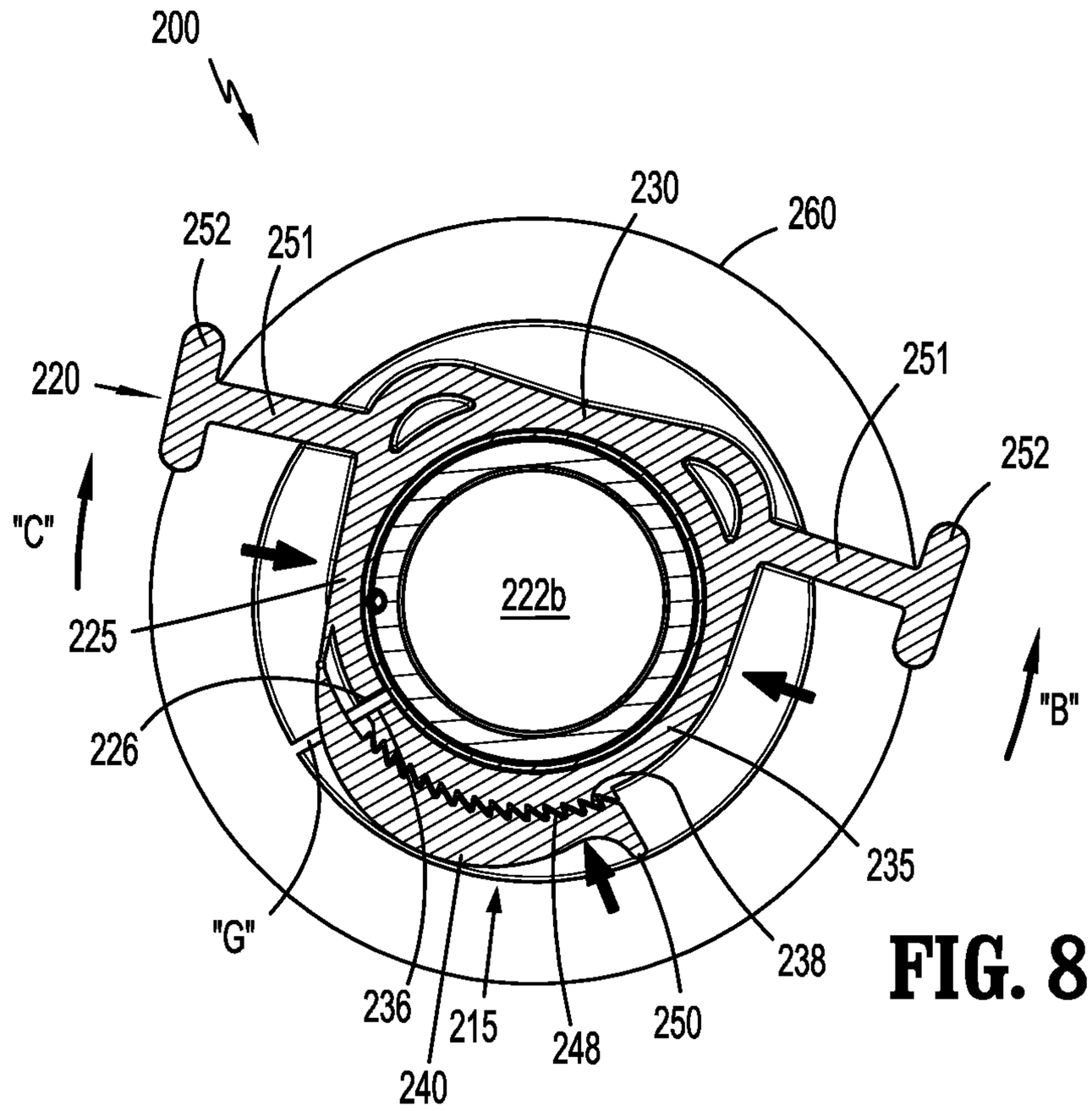

200
230
260
252
251
220
251
252
"C"
222b
225
226
"B"
235
"G"
238
236
215
248
250
240

FIG. 8

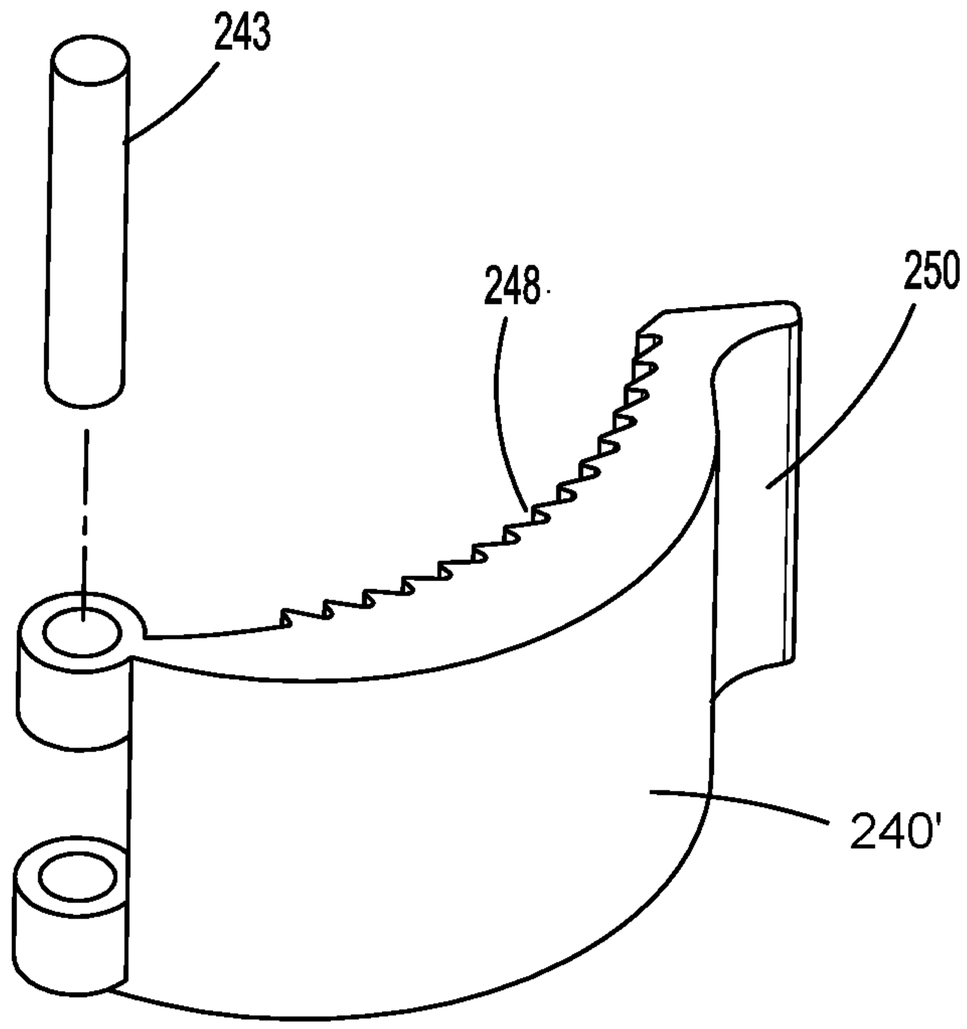

243
248
250
240'

FIG. 9

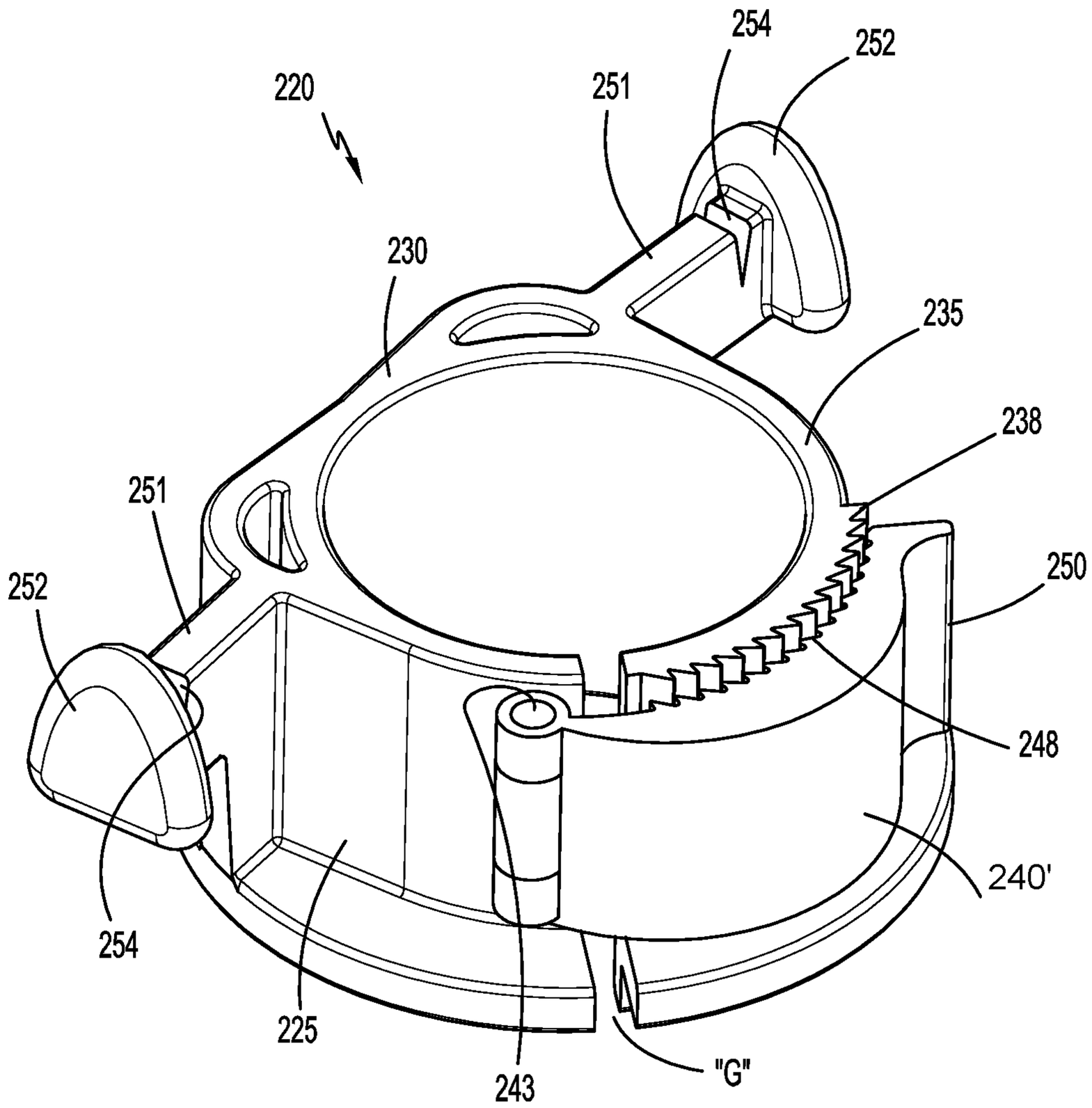


FIG. 10

SURGICAL ACCESS DEVICE INCLUDING ANCHOR WITH RACHET MECHANISM

BACKGROUND

Technical Field

The present disclosure relates to a surgical access device. More particularly, the present disclosure relates to a surgical access device including an anchor with a ratchet mechanism to help maintain its position relative to a patient during a surgical procedure.

Background of Related Art

In minimally invasive surgical procedures, including endoscopic and laparoscopic surgeries, a surgical access device permits the introduction of a variety of surgical instruments into a body cavity or opening. A surgical access device (e.g., a cannula) is introduced through an opening in tissue (i.e. a naturally occurring orifice or an incision) to provide access to an underlying surgical site in the body. The incision is typically made using an obturator having a blunt or sharp tip that has been inserted within the passageway of the surgical access device. For example, a cannula has a tube of rigid material with a thin wall construction, through which an obturator may be passed. The obturator is utilized to penetrate a body wall, such as an abdominal wall, or to introduce the surgical access device through the body wall, and is then removed to permit introduction of surgical instrumentation through the surgical access device to perform the surgical procedure.

During these procedures, it may be challenging to maintain the position of the surgical access device with respect to the body wall, particularly when exposed to a pressurized environment. To help maintain the position of the surgical access device with respect to the body wall, an anchor positioned near a distal end of the surgical access device and adjacent tissue is occasionally used. Positioning and securing such an anchor while the surgical access device is within the body helps minimize undesired movement of the surgical access device with respect to the body.

Accordingly, it may be helpful to provide an anchor with a ratchet mechanism to help maintain the longitudinal position of the surgical access device with respect to the patient.

SUMMARY

The present disclosure relates to a surgical access device including a cannula body and an anchor. The cannula body includes a housing and an elongated portion extending distally from the housing. The elongated portion defines a longitudinal axis and defines a channel extending therethrough. The anchor is disposed in mechanical cooperation with the elongated portion of the cannula body and is longitudinally translatable relative to the elongated portion. The anchor defines an aperture and includes a ratchet mechanism configured to selectively lock a size of the aperture.

In aspects, the ratchet mechanism of the anchor includes a C-shaped clip. The clip may include a first arcuate section and a second arcuate section, where the first arcuate section is movable relative to the second arcuate section.

In aspects, the ratchet mechanism of the anchor includes a clip and a handle, and the handle is pivotable relative to the clip. The ratchet mechanism may include a plurality of teeth disposed on at least one of the first arcuate section of the clip or the second arcuate section of the clip. Movement of the first arcuate section relative to the second arcuate section may change the size of the aperture defined by the anchor. The ratchet mechanism may include a plurality of teeth disposed on the handle of the clip configured to engage the plurality of teeth of the at least one of the first arcuate section of the clip or the second arcuate section of the clip. The handle may include a tab configured to facilitate disengagement of the plurality of teeth of the handle from the plurality of teeth of the at least one of the first arcuate section of the clip or the second arcuate section of the clip.

In additional aspects, the anchor may include a sleeve radially surrounding at least a portion of the clip. The sleeve may be made from foam, gel, or rubber.

The present disclosure also relates to an anchor for use with a surgical access device. The anchor defines an aperture and includes a C-shaped clip, and a handle. The C-shaped clip includes a first arcuate section, a section arcuate section and a backspan interconnecting the first arcuate section and the second arcuate section. The first arcuate section is movable relative to the second arcuate section to change a size of the aperture. At least one of the first arcuate section or the second arcuate section includes a plurality of teeth. The handle is pivotably engaged with the first arcuate section of the C-shaped clip. The handle includes a plurality of teeth configured to engage the plurality of teeth of the at least one of the first arcuate section or the second arcuate section of the C-shaped clip to selectively lock a position of the first arcuate section relative to the second arcuate section.

In aspects, the handle may include a tab configured to facilitate disengagement of the plurality of teeth of the handle from the plurality of teeth of the at least one of the first arcuate section of the clip or the second arcuate section of the clip. The anchor may also include a sleeve radially surrounding at least a portion of the C-shaped clip. The sleeve may be made from foam, gel, or rubber.

DESCRIPTION OF THE DRAWINGS

Various aspects of the present disclosure are illustrated herein with reference to the accompanying drawings, wherein:

FIG. **1** is a perspective view of a surgical access device including an anchor in accordance with the present disclosure;

FIG. **2** is an assembly view of the surgical access device of FIG. **1**;

FIGS. **3** and **4** are perspective views of a portion of the anchor of FIGS. **1** and **2**;

FIG. **5** is a side view of the surgical access device of FIGS. **1** and **2** within tissue illustrating the anchor in a proximal position;

FIG. **6** is a top cross-sectional view of a portion of the surgical access device taken along section line **6-6** in FIG. **5**;

FIG. **7** is a side view of the surgical access device of FIGS. **1** and **2** within tissue illustrating the anchor in a distal position;

FIG. **8** is a top cross-sectional view of a portion of the surgical access device taken along section line **8-8** in FIG. **7**;

FIG. **9** is an assembly view of a handle of the anchor according to various aspects; and

FIG. **10** is a perspective of the anchor including the handle of FIG. **9**.

DETAILED DESCRIPTION

Aspects of the presently disclosed surgical access device will now be described in detail with reference to the draw-

ings wherein like numerals designate identical or corresponding elements in each of the several views. As is common in the art, the term "proximal" refers to that part or component closer to the user or operator, i.e. surgeon or physician, while the term "distal" refers to that part or component farther away from the user.

Generally, the surgical access device or cannula, often part of a trocar assembly, may be employed during surgery (e.g., laparoscopic surgery) and may, in various aspects, provide for the sealed access of laparoscopic surgical instruments into an insufflated body cavity, such as the abdominal cavity. The cannula is usable with an obturator insertable therethrough. The cannula and obturator are separate components but are capable of being selectively connected together. For example, the obturator may be inserted into and through the cannula until the handle of the obturator engages, e.g., selectively locks into, a proximal housing of the cannula. In this initial position, the trocar assembly is employed to tunnel through an anatomical structure, e.g., the abdominal wall, either by making a new passage through the structure or by passing through an existing opening through the structure. Once the trocar assembly has tunneled through the anatomical structure, the obturator is removed, leaving the cannula in place in the structure, e.g., in the incision created by the trocar assembly. The proximal housing of the cannula may include seals or valves that prevent the escape of insufflation gases from the body cavity, while also allowing surgical instruments to be inserted into the body cavity.

Additionally, the surgical access device of the present disclosure includes an anchor including a ratchet mechanism configured to engage tissue to help maintain the cannula in its position relative to the body during use.

FIGS. **1-10** illustrate a surgical access device according to the present disclosure. With initial reference to FIG. **1**, the surgical access device **10** includes a cannula body **100** and an anchor **200**. The cannula body **100** includes a proximal housing **120** at its proximal end, and includes an elongated portion **140** extending distally from the proximal housing **120**. The elongated portion **140** defines a channel **150** (FIG. **2**) extending therethrough, and defines a longitudinal axis "A-A." An obturator (not shown) is insertable through the channel **150** and is engageable with the proximal housing **120**, for instance.

The anchor **200** is positionable around the elongated portion **140** of the cannula body **100** such that such that the anchor **200** radially surrounds a portion of the elongated portion **140**. More particularly, the anchor **200** is longitudinally translatable along the elongated portion **140** between a first position, where the anchor **200** is farther away from a distal tip **142** of the elongated portion **140** (FIG. **5**), and a second position, wherein the anchor **200** is closer to the distal tip **142** of the elongated portion **140** (FIG. **7**). Additionally, the anchor **200** is configured to translate longitudinally along the elongated portion **140** of the cannula body **100**, and to releasably and selectively lock itself into a desired longitudinal position.

Referring to FIGS. **1** and **2**, the engagement between the anchor **200** and the cannula body **100** is shown. The anchor **200** includes a clip **220**, a handle **240**, and a sleeve **260**. The clip **220** of the anchor **200** defines an aperture **222**, through which the elongated portion **140** of the cannula body **100** is insertable.

FIGS. **3** and **4** illustrate further details of the clip **220** and the handle **240**. The clip **220** includes a first arcuate section **225** and a second arcuate section **235**, which together define the aperture **222**. In aspects, the clip **220** may be C-shaped including an adjustable gap "G" defined between the first arcuate section **225** and the second arcuate section **235**. The first arcuate section **225** is movable relative to the second arcuate section **235** (or vice versa) between a first orientation defining a first size aperture **222***a* (FIGS. **3**, **4** and **6**) and a second orientation defining a second size aperture **222***b* (FIG. **8**). The first size aperture **222***a* is larger than the second size aperture **222***b*; the gap "G" corresponding to the first size aperture **222***a* is larger than the gap "G" corresponding to the second size aperture **222***b*. In the first orientation, where the clip **220** defines a larger aperture **222***a*, the anchor **200** is longitudinally translatable along the elongated portion **140** of the cannula body **100**. In the second orientation, where the clip **220** defines a smaller aperture **222***b*, the anchor **200** is fixed from translating longitudinally along the elongated portion **140** of the cannula body **100**. As discussed below, a ratchet mechanism **215** is included on the anchor **200** to selectively lock the size of the aperture **222** defined by the anchor **200**.

With continued reference to FIGS. **3** and **4**, the handle **240** of the anchor **200** is shown. The handle **240** is arcuate, is coupled to a portion of the clip **220**, and is pivotable relative to the clip **220**. In the aspects shown in FIGS. **2-4**, for instance, the handle **240** is integrally formed with the clip **220** (e.g., molded as a part of the clip **220**), and includes a living hinge therebetween.

In the aspects shown in FIGS. **9** and **10**, for instance, a handle **240'** connects to the clip **220** via a pin **243**. In the illustrated aspects, the handle **240'** is pivotably engaged with the first arcuate section **225** of the clip **220**, although the handle may alternatively be engaged with a different portion of the clip **220** (e.g., the second arcuate section **235**). As discussed below, pivoting the handle **240'** relative to the clip **220** moves the clip **220** between its first orientation and its second orientation.

Referring now to FIGS. **3**, **4**, **6** and **8**, further details of the clip **220** and the handle **240** of the anchor **200** are shown. The first arcuate section **225** and the second arcuate section **235** of the clip **220** each extend from a common backspan **230**. The first arcuate section **225** defines a free end **226**, which is spaced from the backspan **230**, and the second arcuate section **235** defines a free end **236**, which is spaced from the backspan **230**. Depending on the orientation of the clip **220**, a gap "G" is defined between the free end **226** of the first arcuate section **225** and the free end **236** of the second arcuate section **235**. As the clip **220** moves from its first orientation to its second orientation, the gap "G" and the aperture **222** defined by the anchor **200** become smaller. In aspects (e.g., depending on the diameter of the elongated portion **140** of the cannula body **100**), the free end **226** of the first arcuate section **225** is spaced from the free end **236** of the second arcuate section **235** when the clip **220** is in its second orientation. In other aspects, the free end **226** of the first arcuate section **225** contacts the free end **236** of the second arcuate section **235** when the clip **220** is in its second orientation. In yet other aspects, the free end **226** of the first arcuate section **225** overlaps the free end **236** of the second arcuate section **235** when the clip **220** is in its second orientation.

With continued reference to FIGS. **3**, **4**, **6** and **8**, a ratchet mechanism **215** is shown and is disposed on portions of the clip **220**. The ratchet mechanism **215** selectively locks the size of the aperture **222** defined by the anchor **200**. The first arcuate section **225** of the clip **220** includes an upper portion **225***a* and a lower portion **225***b*, and the second arcuate section **235** of the clip **220** includes an upper portion **235***a* and a lower portion **235***b* (FIG. **4**). The ratchet mechanism **215** is included on the upper portion **235***a* of the second

arcuate section **235** and on the handle **240**. More particularly, the ratchet mechanism **215** includes a plurality of grooves or teeth **238** (i.e., one or more teeth) on the upper portion **235***a* of the second arcuate section **235**, and a plurality of grooves or teeth **248** (i.e., one or more teeth) on the handle **240**. The plurality of teeth **238** of the second arcuate section **235** is configured to engage the plurality of teeth **248** of the handle **240** in a ratcheting manner. In particular, the plurality of teeth **238** of the second arcuate section **235** and the plurality of teeth **248** of the handle **240** are angled such that movement of the handle **240** in a first direction (e.g., arrow "B" in FIG. **8**) relative to the second arcuate section **235** is facilitated, while movement of the handle **240** in a second, opposite direction (e.g., arrow "C" in FIG. **8**) relative to the second arcuate section **235** is hindered or prevented. That is, the plurality of teeth **238** of the second arcuate section **235** and the plurality of teeth **248** of the handle **240** are configured to facilitate incremental movement of the clip **220** from its first orientation toward its second orientation, and effectively locks the clip **220** in a desired position (e.g., when the clip **220** is tight around the elongated portion **140** of the cannula body **100**). Additionally, in various aspects, the first arcuate section **225** also includes a plurality of teeth that are configured to engage the plurality of teeth **248** of the handle **240**.

As shown in FIGS. **3**, **4**, **6** and **8-10**, the handle **240** also includes a tab **250** extending radially outwardly from an end of the handle **240**. The tab **250** is configured to be grasped by a user such that manipulation of the handle **240** is facilitated. More particularly, a user can grasp or press the tab **250** of the handle **240** to move (e.g., pivot) the handle **240** relative to the second arcuate section **235** of the clip **220**, such as when moving the clip **220** from its first orientation toward its second orientation. Additionally, a user can move the tab **250** away from the second arcuate section **235** of the clip **220** (in the general direction of arrow "D" in FIG. **6**) to effectively unlock the plurality of teeth **248** of the handle **240** from the plurality of teeth **238** of the second arcuate section **235**.

In various aspects, the tensile strength of the material of the handle **240** helps the handle **240** remain engaged with the second arcuate section **235**. For instance, the handle **240** may be made from plastic or other suitable materials.

As shown in FIGS. **3**, **4**, **6**, **8** and **10**, the clip **220** also includes arms **251**. The arms **251** are shown extending radially outward from a portion of the clip **220** adjacent the backspan **230**. The arms **251** may be useful to grasp while longitudinally translating the anchor **200** along the elongated portion **140** of the cannula body **100**. Additionally, each arm **251** includes a finger **252** at an end thereof, and defines a notch **254**. The fingers **252** and/or notches **254** can be used as locations to tie sutures to during use, for instance. In aspects, the clip **220** may include more or fewer arms **251** than the two arms **251** that are illustrated. For instance, the clip **220** may not include any arms **251**.

The sleeve **260** is shown in FIGS. **1**, **2** and **5-8**. The sleeve **260** radially surrounds the lower portions **225***b*, **235***b* of the first arcuate portion **225** and the second arcuate portion **235**, respectively, of the clip **220**. In aspects, the sleeve **260** is secured to the clip **220** such that the sleeve **260** and the clip **220** cannot be moved independently of each other. The sleeve **260** is configured to radially expand and contract such that the sleeve **260** remains in contact with the first arcuate portion **225** and the second arcuate portion **235** while the clip **220** transitions between its first and second orientations. Additionally, the sleeve **260** is configured to longitudinally compress in response to being moved against a tissue wall "T," for instance, as indicated by arrows "E" in FIG. **7**. The sleeve **260** may be made from foam, gel, rubber (e.g., elastomers), or other suitable compressive material.

Additionally, as shown in FIGS. **1**, **2**, **5** and **7**, the anchor **200** can be used in connection with an additional fixation mechanism **300**. For instance, as shown in FIGS. **5** and **7**, while the anchor **200** may be positioned along the elongated portion **140** of the cannula body **100** adjacent a proximal wall of tissue adjacent an incision, fixation mechanism **300** can radially extend from the elongated portion **140** of the cannula body **100** and be positioned adjacent a distal wall of the tissue adjacent the incision, for example.

In use, the anchor **200** is initially in a proximal position along the elongated portion **140** of the cannula body **100** as the distal end of the cannula body **100** is being inserted into and/or positioned within the tissue cavity "C" (FIGS. **5** and **7**). Next, the fixation mechanism **300**, if included, is moved to expanded position (FIGS. **5** and **7**), and the cannula body **100** is moved proximally such that the fixation mechanism **300** contacts the distal portion of the tissue wall "T," for instance. Then, the anchor **200** is moved distally along the elongated portion **140** of the cannula body **100** such that the anchor **200** contacts a proximal portion of the tissue wall "T," and the ratchet mechanism **215** is utilized to decrease and lock the size of the aperture **222** such that the anchor is fixed positioned on the elongated portion **140** of the cannula body **100**. Here, the tissue wall "T" is sandwiched between the anchor **200** and the fixation mechanism **300** (FIG. **7**), and the longitudinal position of the cannula body **100** is fixed relative to the tissue wall "T."

While the above description contains many specifics, these specifics should not be construed as limitations on the scope of the present disclosure, but merely as illustrations of various aspects thereof. Therefore, the above description should not be construed as limiting, but merely as exemplifications of various aspects. Those skilled in the art will envision other modifications within the scope and spirit of the claims appended hereto.

What is claimed is:

1. A surgical access device, comprising:

a cannula body including a housing and an elongated portion extending distally from the housing, the elongated portion defining a longitudinal axis and defining a channel extending through the elongated portion;

an anchor disposed in mechanical cooperation with the elongated portion of the cannula body and being longitudinally translatable relative to the elongated portion, the anchor defining an aperture and including a ratchet mechanism for selectively locking a size of the aperture; and

a sleeve radially surrounding at least a portion of the anchor.

2. The surgical access device according to claim **1**, wherein the ratchet mechanism of the anchor includes a C-shaped clip.

3. The surgical access device according to claim **2**, wherein the clip includes a first arcuate section and a second arcuate section, the first arcuate section being movable relative to the second arcuate section.

4. The surgical access device according to claim **2**, wherein the sleeve radially surrounds at least a portion of the C-shaped clip.

5. The surgical access device according to claim **1**, wherein the ratchet mechanism of the anchor includes a clip and a handle, the handle being pivotable relative to the clip.

6. The surgical access device according to claim **5**, wherein the clip includes a first arcuate section and a second

arcuate section, the first arcuate section being movable relative to the second arcuate section.

7. The surgical access device according to claim **6**, wherein the ratchet mechanism includes a plurality of teeth disposed on at least one of the first arcuate section of the clip or the second arcuate section of the clip.

8. The surgical access device according to claim **7**, wherein the ratchet mechanism includes a plurality of teeth disposed on the handle of the clip for engaging the plurality of teeth of the at least one of the first arcuate section of the clip or the second arcuate section of the clip.

9. The surgical access device according to claim **8**, wherein the handle includes a tab for facilitating disengagement of the plurality of teeth of the handle from the plurality of teeth of the at least one of the first arcuate section of the clip or the second arcuate section of the clip.

10. The surgical access device according to claim **6**, wherein movement of the first arcuate section relative to the second arcuate section changes the size of the aperture defined by the anchor.

11. The surgical access device according to claim **5**, wherein the sleeve radially surrounds at least a portion of the clip.

12. The surgical access device according to claim **1**, wherein the sleeve is made from foam, gel, or rubber.

13. An anchor for use with a surgical access device, the anchor defining an aperture and comprising:

a C-shaped clip including a first arcuate section, a section arcuate section and a backspan interconnecting the first arcuate section and the second arcuate section, the first arcuate section movable relative to the second arcuate section to change a size of the aperture, at least one of the first arcuate section or the second arcuate section including a plurality of teeth; and

a handle pivotably engaged with the first arcuate section of the C-shaped clip, the handle including a plurality of teeth configured to engage the plurality of teeth of the at least one of the first arcuate section or the second arcuate section of the C-shaped clip to selectively lock a position of the first arcuate section relative to the second arcuate section.

14. The anchor according to claim **13**, wherein the handle includes a tab for facilitating disengagement of the plurality of teeth of the handle from the plurality of teeth of the at least one of the first arcuate section of the clip or the second arcuate section of the clip.

15. The anchor according to claim **13**, further including a sleeve radially surrounding at least a portion of the C-shaped clip.

16. The anchor according to claim **15**, wherein the sleeve is made from foam, gel, or rubber.

17. A surgical access device, comprising:

a cannula body including a housing and an elongated portion extending distally from the housing, the elongated portion defining a longitudinal axis and defining a channel extending through the elongated portion; and

an anchor disposed in mechanical cooperation with the elongated portion of the cannula body and being longitudinally translatable relative to the elongated portion, the anchor defining an aperture and including a ratchet mechanism for selectively locking a size of the aperture, the ratchet mechanism including a clip and a handle, the handle being pivotable relative to the clip, and the clip including a first arcuate section and a second arcuate section, the first arcuate section being movable relative to the second arcuate section.

18. The surgical access device according to claim **17**, further including a sleeve radially surrounding at least a portion of the anchor.

19. The surgical access device according to claim **18**, wherein the sleeve is made from at least one of foam, gel, or rubber.

20. The surgical access device according to claim **17**, wherein the anchor includes a first arcuate section and a second arcuate section, the first arcuate section being movable relative to the second arcuate section.

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